IN THE CLAIMS:

1. (Currently Amended): An apparatus for controlling fluid supply to a clutch pack of an automatic transmission of a vehicle having an engine, the apparatus comprising:

a detecting unit for detecting an operating state of a vehicle and abnormal operation thereof;

a control unit for determining if an output of the detecting unit satisfies a pre-fill time control condition and thereby for controlling fluid supply to a clutch pack of an automatic transmission on a basis of a pre-fill time calculated on the basis of output of the detecting unit; and

a fluid supply unit for supplying fluid to the clutch pack under control of the control unit;

wherein the detecting unit comprises:

an ignition detector for detecting running of an engine;

an engine speed detector for detecting a current engine speed;

a turbine speed detector for detecting a turbine speed of the automatic transmission that is input to a shift mechanism of the transmission;

an output-shaft speed detector for detecting an output-shaft speed of the shift mechanism of the transmission;

a fluid temperature detector for detecting a fluid temperature, the fluid being used for forming pressure of the clutch pack to engage the clutch;

a throttle opening detector for detecting a throttle valve opening; and

a malfunction detector for detecting a malfunction of the vehicle; and

wherein the pre-fill time control condition comprises:

the automatic transmission being in a first speed for the first time after the engine is restarted; and

a difference between fluid temperatures of before the engine is stopped and after the engine is restarted being greater than a predetermined difference.

2. (Canceled).

3. (Currently amended): The apparatus of ~~claim 2~~ claim 1, wherein the pre-fill

time control condition further comprises:

~~the automatic transmission is in a first speed for the first time after the engine is restarted;~~

the engine speed is greater than a predetermined engine speed;

the engine speed is greater than a turbine speed;

the output-shaft speed of the shift mechanism is greater than a predetermined output speed;

the throttle valve opening is greater than a predetermined opening;

~~a difference between fluid temperatures of before the engine is stopped and after the engine is restarted is greater than a predetermined difference;~~ and

a malfunction of the vehicle is not detected.

4. (Currently Amended): An apparatus for controlling fluid supply to a clutch pack of an automatic transmission of a vehicle having an engine, the apparatus comprising:

a detecting unit for detecting an operating state of a vehicle and abnormal operation thereof;

a control unit for determining if an output of the detecting unit satisfies a pre-fill time control condition and thereby for controlling fluid supply to a clutch pack of an automatic transmission on a basis of a pre-fill time calculated on the basis of output of the detecting unit; and

a fluid supply unit for supplying fluid to the clutch pack under control of the control unit; ~~The apparatus of claim 1~~, wherein the pre-fill time is calculated on the basis of the equations:

$$1st\_Pre\_t_F = (S_C + S_{CL} - S_{CM\_OCP}) \times K_E \times K_{T2} + \Delta t_{F\_Pre};$$ and

$$nxt\_Pre\_t_F = (S_C + S_{CL} - S_{CM}) \times K_E \times K_{T2},$$

wherein:

$1st\_Pre\_t_F$ denotes a first pre-fill time;

$nxt\_Pre\_t_F$ denotes the next pre-fill time that occurs after the first pre-fill time;

S_C denotes a base fill time;

S_{CL} denotes a learned value for the fill time;

S_{CM_OCP} denotes a marginal pre-fill time;

S_{CM} denotes a marginal time for the clutch fill time;

k_E denotes a correction coefficient for engine speed;

k_{T2} denotes a correction coefficient for fluid temperature; and

Δt_{F_Pre} denotes a pre-fill time according to draining of the fluid, the pre-fill time being proportional to a period during which the engine remains stopped.

5. (Currently Amended): A method for controlling fluid supply to a clutch pack of an automatic transmission of a vehicle having an engine, the method comprising:

detecting an operating state of a vehicle after an engine is restarted;

determining if the operating state satisfies a pre-fill time control condition;

controlling, when the operating state satisfies the pre-fill time control condition, fluid supply to a clutch pack of an automatic transmission on a basis of a pre-fill time calculated on a basis of the operating state;

determining, during the controlling of the fluid supply to the clutch pack, if a pre-fill control release condition is satisfied; and

stopping, when the pre-fill control release condition is satisfied, the controlling of the fluid supply to the clutch pack and performing normal hydraulic control of the transmission;

wherein the pre-fill time control condition comprises:

the automatic transmission being in a first speed for the first time after the engine is restarted; and

a difference between fluid temperatures of before the engine is stopped and after the engine is restarted being greater than a predetermined difference.

6. (Currently Amended): The method of claim 5, wherein the pre-fill time control condition further comprises:

~~the automatic transmission is in a first speed for the first time after the engine is restarted;~~

the engine speed is greater than a predetermined engine speed;

the engine speed is greater than a turbine speed;

the output speed of the shift mechanism is greater than a predetermined output speed;

the throttle valve opening is greater than a predetermined opening;

~~a difference between fluid temperatures of before the engine is stopped and after the engine is restarted is greater than a predetermined difference;~~ and

a malfunction of the vehicle is not detected.

7. (Original): The method of claim 6, wherein the pre-fill time is calculated on the basis of the equations:

$$1st\_Pre\_t_F = (S_C + S_{CL} - S_{CM\_OCP}) \times K_E \times K_{T2} + \Delta t_{F\_Pre};$$ and

$$nxt\_Pre\_t_F = (S_C + S_{CL} - S_{CM}) \times K_E \times K_{T2},$$

wherein:

1st_Pre_t_F denotes a first pre-fill time;

nxt_Pre_t_F denotes the next pre-fill time that occurs after the first pre-fill time;

S_C denotes a base fill time;

S_{CL} denotes a learned value for the fill time;

S_{CM_OCP} denotes a marginal pre-fill time;

S_{CM} denotes a marginal time for the clutch fill time;

k_E denotes a correction coefficient for engine speed;

k_{T2} denotes a correction coefficient for fluid temperature; and

Δt_{F_Pre} denotes a pre-fill time according to draining of the fluid, the pre-fill time being proportional to a period during which the engine remains stopped.